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(54) **UMBRELLA ASSEMBLY**

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A45B 11/00 (2006.01)

(52) **U.S. Cl.**
CPC ***A45B 19/00*** (2013.01); *A45B 11/00* (2013.01); *A45B 2019/008* (2013.01)

(58) **Field of Classification Search**
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USPC 135/15.1, 16, 19.5, 20.3, 25.41, 28, 2, 34,135/27
See application file for complete search history.

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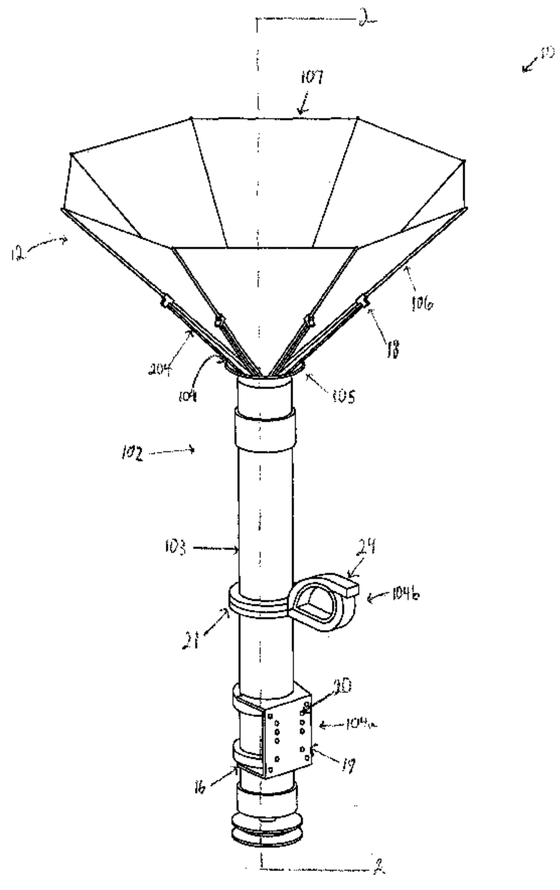
(57) **ABSTRACT**

An umbrella assembly, in one embodiment, includes a housing for a canopy. The umbrella assembly has a mechanism powered to open and close the canopy. During opening, the canopy slides upward through the housing and extends outward in a blooming formation.

20 Claims, 9 Drawing Sheets



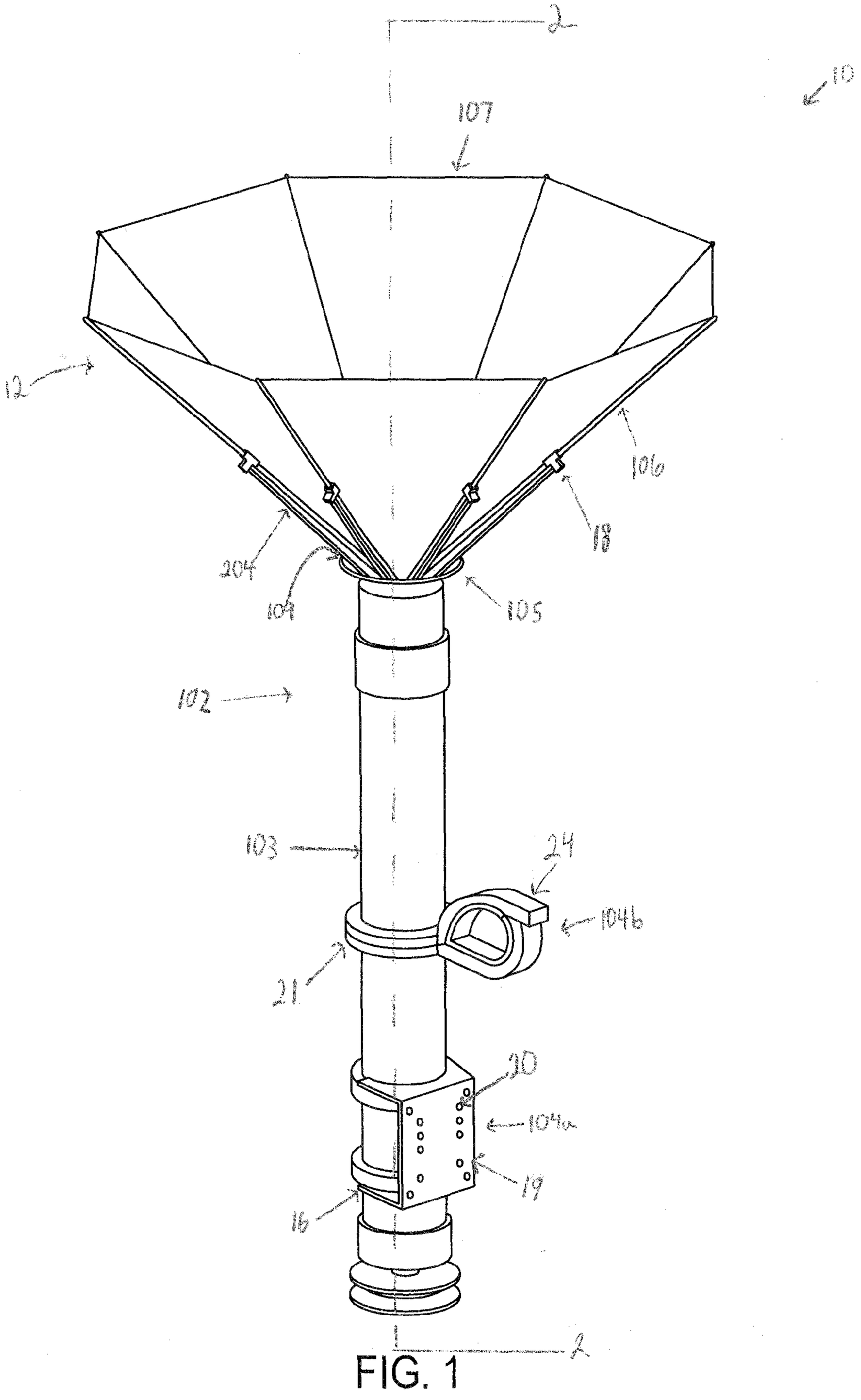


FIG. 1

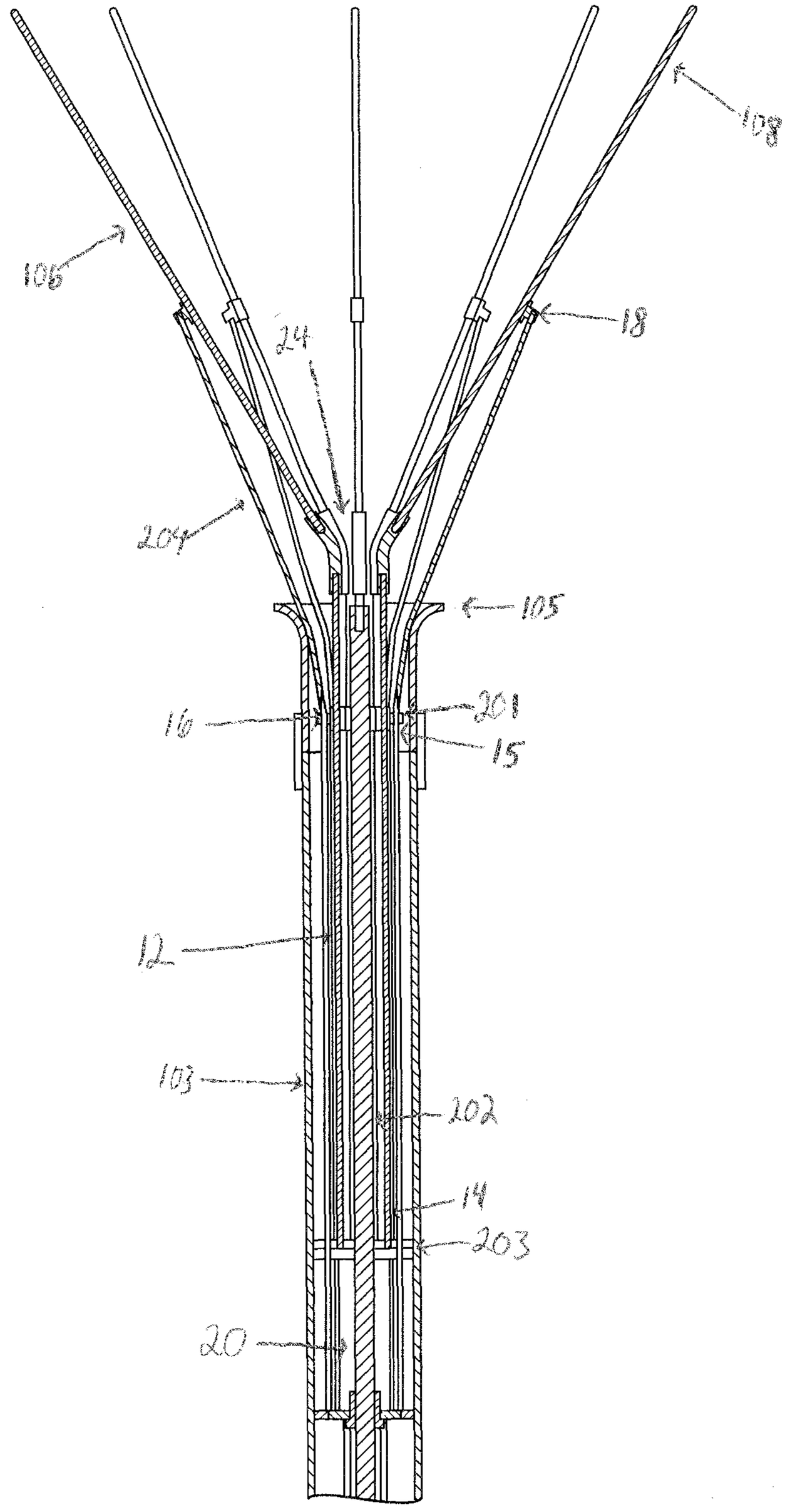


FIG. 2

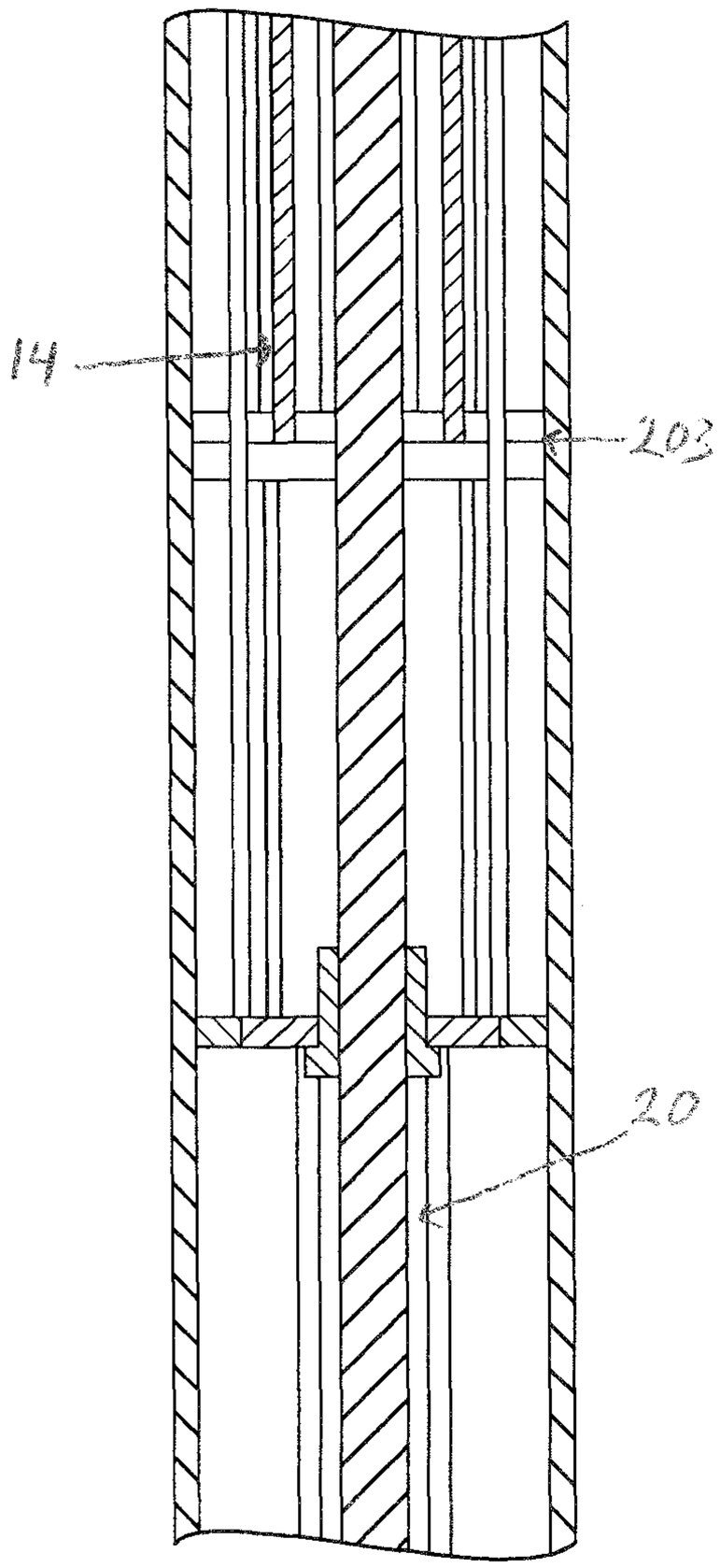


FIG. 3

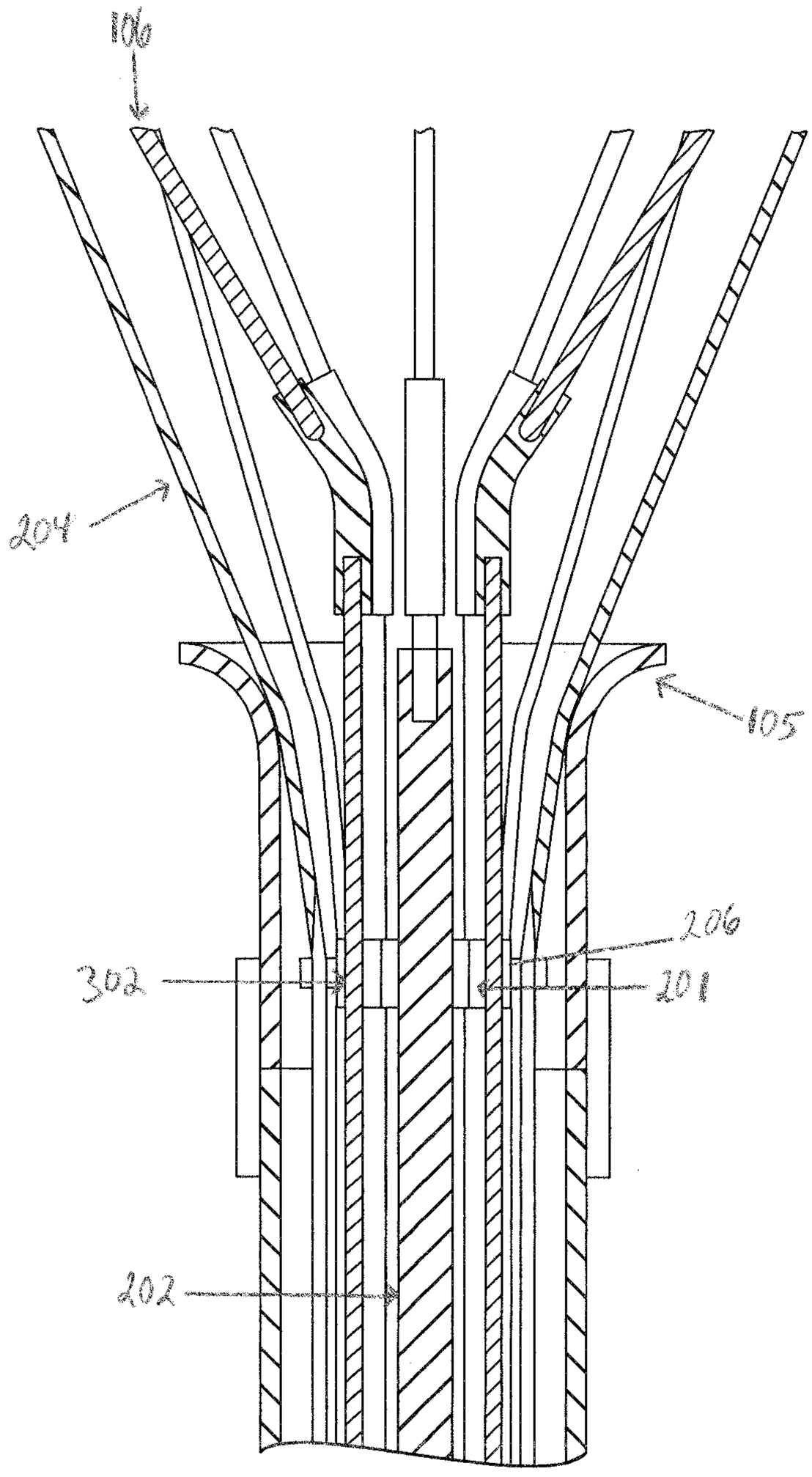


FIG. 4

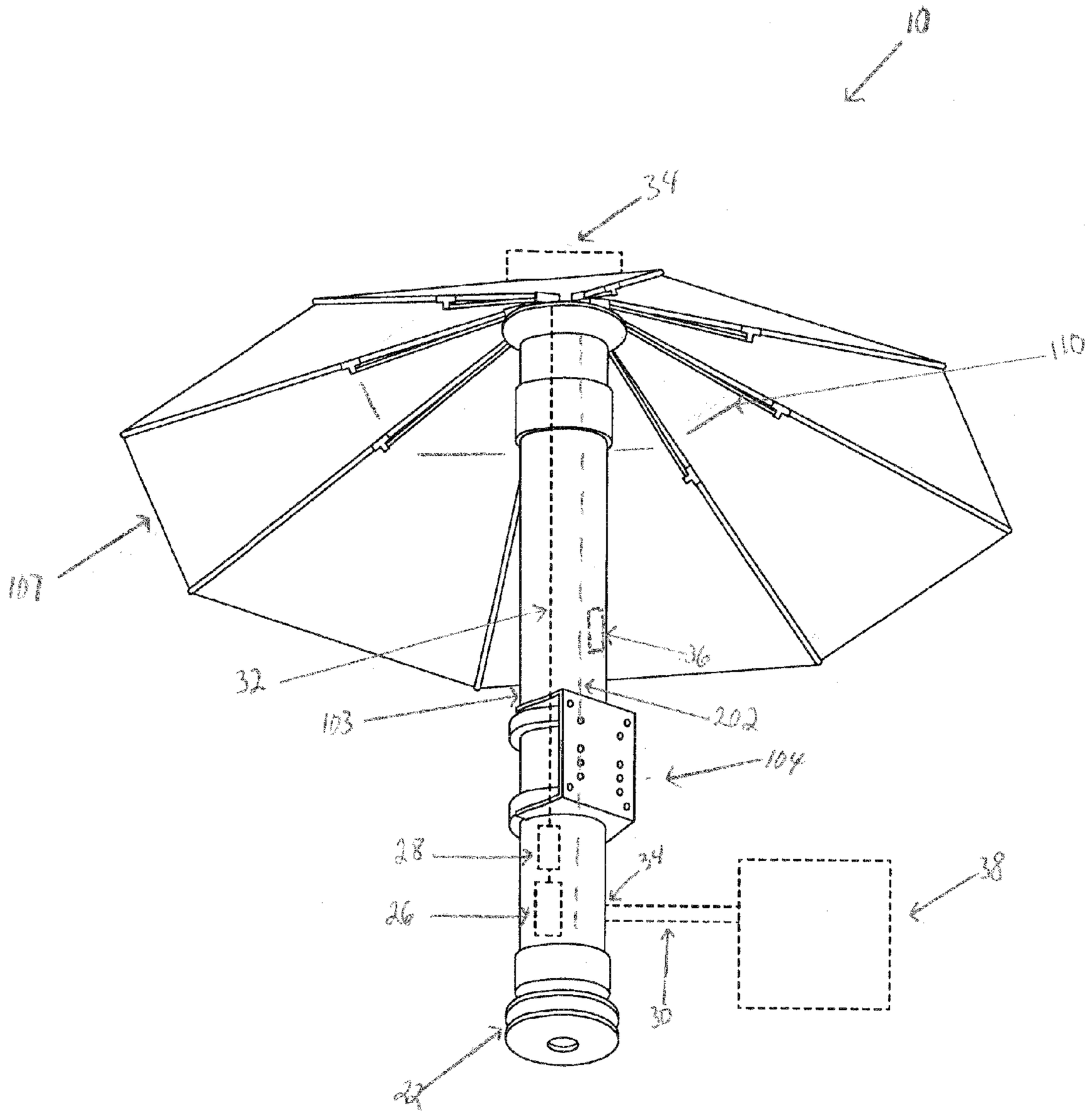


FIG. 5

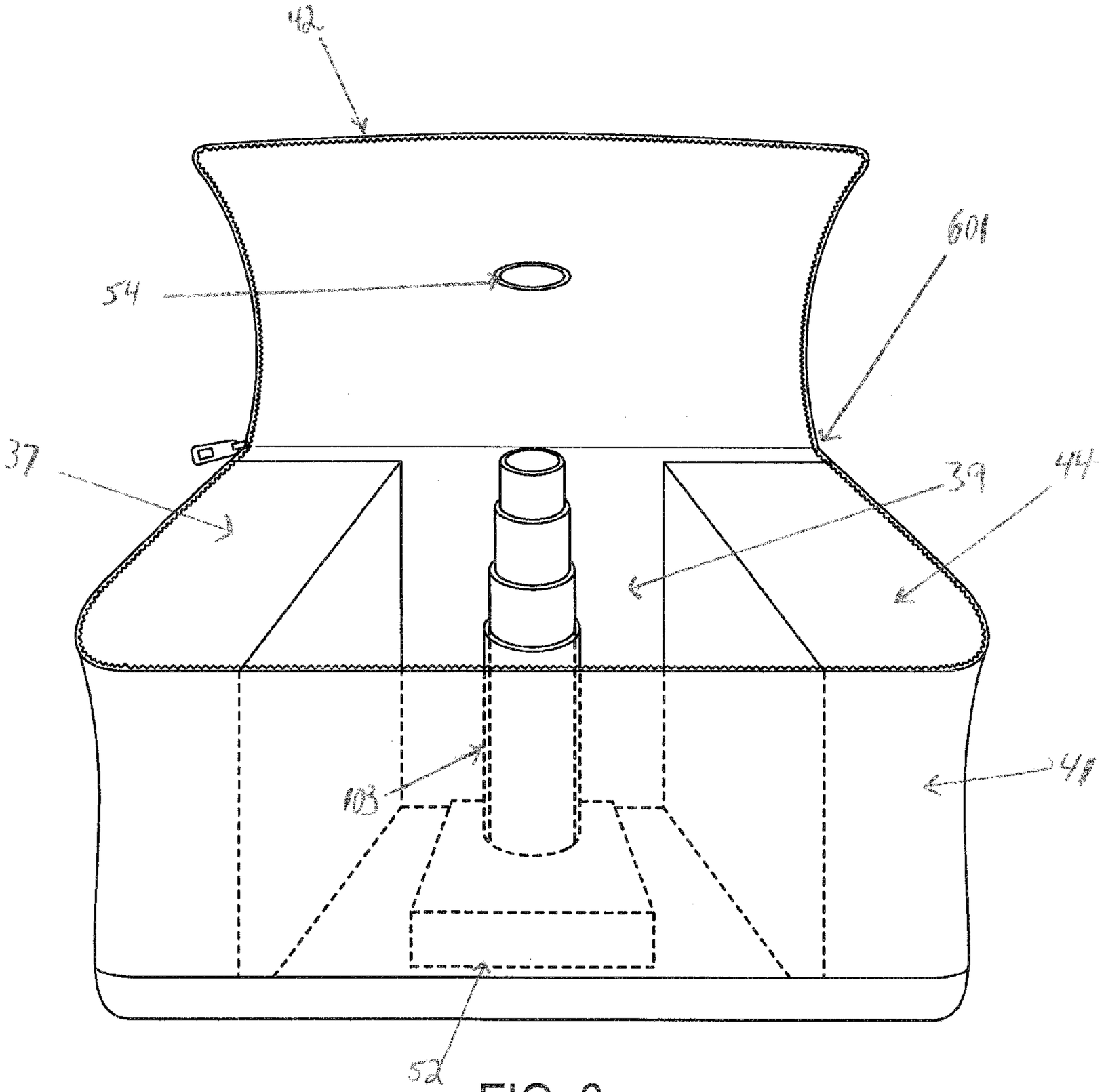


FIG. 6

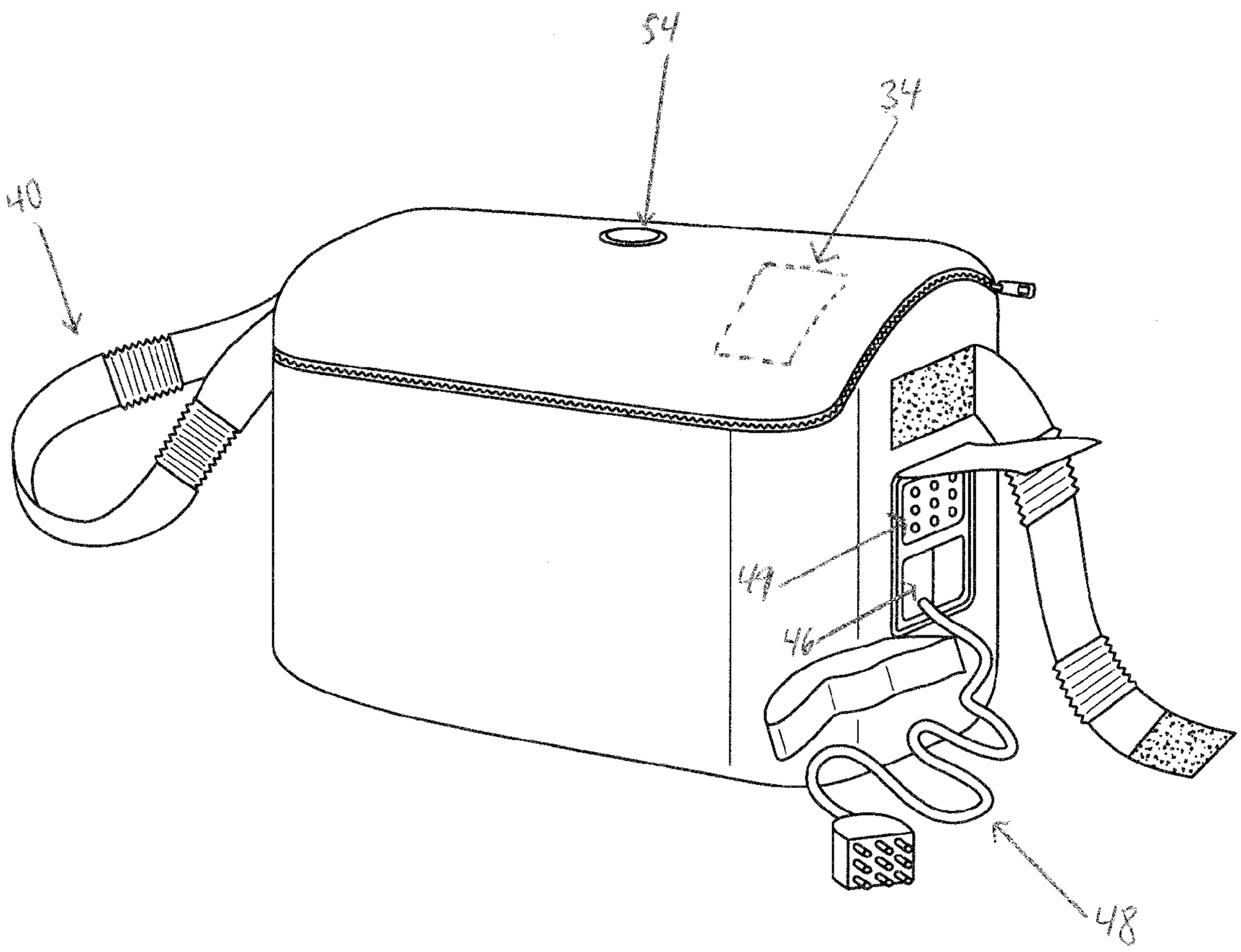


FIG. 7

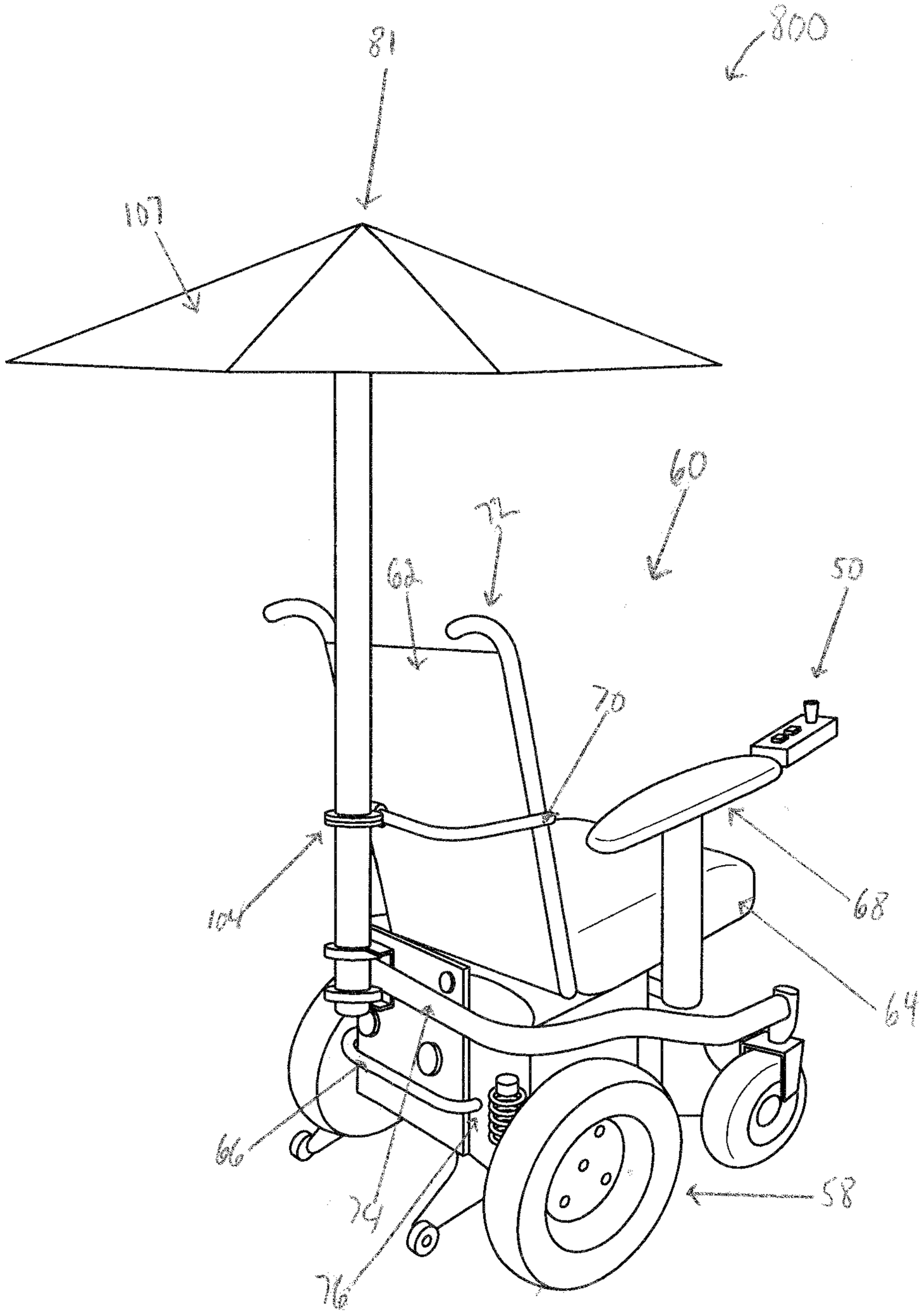


FIG. 8

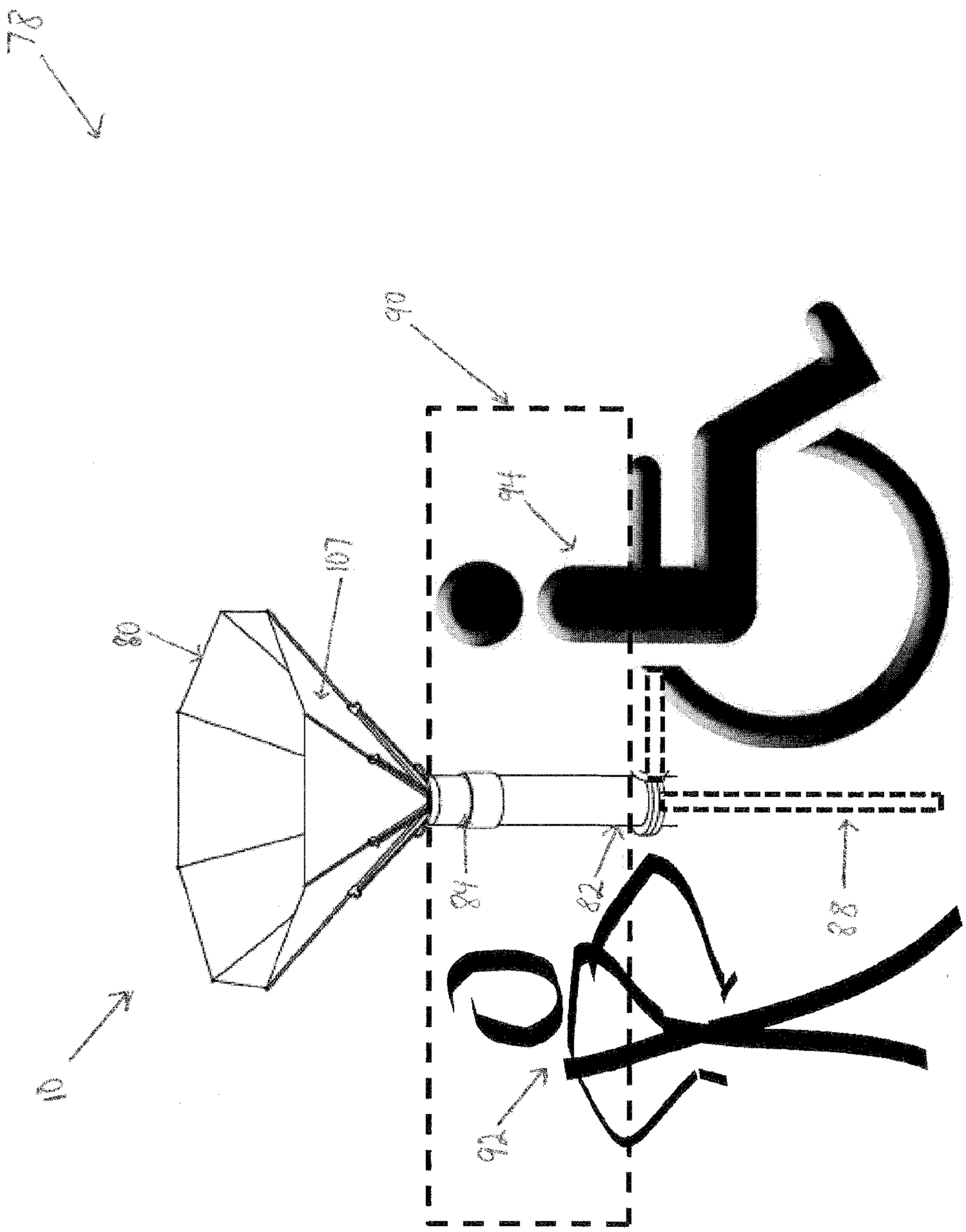


FIG. 9

UMBRELLA ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATION

This application is a non-provisional, and claims the benefit and priority of, U.S. Provisional Patent Application No. 61/946,117, filed on Feb. 28, 2014. The entire contents of such application are hereby incorporated by reference.

BACKGROUND

Conventional umbrellas are known to keep users dry during rainfall. They are notorious for being damaged easily by environmental elements in addition to being cumbersome to deploy and retract. These drawbacks make the conventional umbrella less suited for the variety of situations where its ability to protect a user from environmental elements would be beneficial. There are known umbrellas that are motorized to reduce the manual labor involved, but these umbrellas tend to suffer from additional problems such as interference with objects when opening and closing, relatively high complexity, inadequate stability, lack of modularity, lack of portability and lack of versatility.

SUMMARY

One aspect disclosed herein provides an umbrella assembly which automatically opens and closes. Depending upon the embodiment, the umbrella assembly can be fully automated or partially automated. The umbrella assembly is configured to be coupled to a variety of different types of structures as described below.

In one embodiment, the umbrella assembly has an elongated housing, a plurality of elongated ribs configured to be at least partially housed within the housing, a canopy coupled to the elongated ribs, where the canopy is configured to be housed within the housing, a position control assembly configured to be at least partially housed within the housing, and at least one stop member coupled to the housing. The position control assembly includes a drive member configured to move the elongated ribs between a closed position in which the canopy is housed within the housing, and an open position in which the portions of the elongated ribs extend outside the housing. The position control assembly further includes at least one rib steering device coupled to each of the elongated ribs. The rib steering device is configured to control the angle of the elongated rib relative to the axis. The rib steering devices also stabilize the canopy to withstand an upward force of environmental elements. The stop member is configured to support the elongated ribs when the elongated ribs are in the open position and stabilize the canopy to withstand a downward force of environmental elements.

Additional features and advantages of the present disclosure are described in, and will be apparent from, the following Brief Description of the Drawings and Detailed Description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an isometric view of an embodiment of the umbrella assembly in a partially open position.

FIG. **2** is a cross section view of an embodiment of the umbrella assembly of FIG. **1** taken substantially along line **2-2** of FIG. **1**.

FIG. **3** is an enlarged, fragmentary view of a portion of the umbrella assembly of FIG. **2**, illustrating the central part of the housing.

FIG. **4** is an enlarged, fragmentary view of a portion of the umbrella assembly of FIG. **2**, illustrating the upper part of the housing.

FIG. **5** is an isometric view of an embodiment of the umbrella assembly in a fully open position.

FIG. **6** is an isometric view of an embodiment of the umbrella assembly illustrating an embodiment of the portable pack of the umbrella assembly.

FIG. **7** is an isometric view of the umbrella assembly of FIG. **6**, illustrating an embodiment of the battery unit and other electrical components of the portable pack.

FIG. **8** is a rear, isometric view of an embodiment of a wheelchair having an attached wheelchair umbrella assembly.

FIG. **9** is an isometric view of an embodiment of the umbrella assembly illustrating the blooming formation during the opening process.

DETAILED DESCRIPTION

Referring to FIG. **1**, the umbrella assembly **10**, in one embodiment, includes an encasement, case or housing **103** and one or more couplers **104***a*, **104***b* attached to the housing **103**. The housing **103** allows for containment, storage, protection and mobility of the umbrella sub-assembly **12** described below, including the flexible shield, guard, cover or canopy **107** illustrated in FIGS. **1** and **5**. The housing **103** has an upper end **102** with an outlet, opening or aperture **109** from which deployment and retraction of the canopy **107** occurs. The different couplers **104***a*, **104***b* integrated into, fitted onto or secured to the housing **103**, allow the housing **103** to be attached to a variety of structures, including, but not limited to, a backpack unit for a mail carrier, for example, handbag, suitcase, vehicle, golf cart, stroller, wheelchair, scooter, variety of types of chairs (e.g., beach chair and lawn chair), variety of types of tables (e.g., picnic table, patio table and beach table), buildings, sidewalk, beach, ground, pavement, floor and outdoor electrical devices, such as kiosks and displays screens.

In one embodiment, coupler **104***a* has a plurality of arms **16** and a mounting platform **19**. The arms **16** define a passageway configured to engage, and securely receive, the housing **103**. A set of screws or other suitable fastener can tighten the arms **16** onto the housing **103**. The platform **19** defines a plurality of different sets of hole patterns **20**, where each set is associated with a different structure. For example, hole pattern A can enable attachment to a golf cart, and hole pattern B can enable attachment to a kiosk computer. In another embodiment, coupler **104***b* has a clamp configuration **21** that surrounds the housing. The clamp may be hinged such that it can be opened to accept the housing and closed to clamp onto the housing. In another embodiment, the clamp may have an adjustable diameter which allows it to be placed over an end of the housing and adjusted to properly clamp onto the housing. The coupler **104***b* also has a coupling portion **24**. In the embodiment shown, the coupling portion **24** defines a hole configured to slideably couple the housing to a structure such as the frame of a wheelchair. The coupling portion may be adjustable to enable secure coupling to a variety of structures. In another embodiment, the coupling portion **24** is hinged such that it can be opened to accept a structure and closed to clamp down onto the structure. Fasteners such as screws, may be used to keep the coupling portion in the closed position. One skilled in the art

would appreciate that the couplers **104***a*, **104***b* could take a variety of forms and be located at various locations on the housing **103** depending on the intended use of the assembly **10**.

In one embodiment, one of the couplers **104***a*, **104***b* includes, or is connected to, a stand. The stand, depending upon the embodiment, can be: (a) a weighted base configured to lie on a floor, pavement or ground; (b) a hollow container-type base configured to be filled with water or sand; (c) a spike or ground screw configured to be inserted into the ground or sand; or (d) a mounting base, such as a metal plate with a holes to receive bolts for bolting the umbrella assembly **10** to a cement or concrete pavement. The stand enables the umbrella assembly **10** to be stood upright for operation outdoors in a variety of settings.

A support, stopper or stop member **105** is coupled to the housing **103** at the upper end **102**. As described below with respect to FIG. **5**, the stop member **105** supports the fingers or elongated ribs **106** during deployment and retraction of the canopy **107**. In one embodiment, the canopy **107** includes one or more slits **110** (as seen in FIG. **5**) configured to allow air flow through the canopy **107** without leaking. The canopy **107** can, depending upon the embodiment, include any fully flexible, partially flexible or collapsible rain or weather barrier, including, but not limited to, a tarp, sheet or cover constructed of any suitable material, including, but not limited to, fabric, polymer or plastic.

Referring to FIGS. **2-4**, an embodiment of the umbrella sub-assembly **12** operates to fold and unfold the canopy **107**. The sub-assembly **12** includes: (a) a drive shaft, drive screw or drive member **202**; (b) a guide, anchor or mount **203**, such as a mount plate, defining an opening that receives the drive member and maintains the central position of the drive member **202** within the housing **103**; (c) a drive plate or rib driver **201** operable to push the ribs **106** out of the housing **103** and to also pull the ribs **106** into the housing **103**; (d) a plurality of fingers, tubular-shaped supports or elongated ribs **106** that are attached to the canopy **107**; (e) a plurality of rib guides, rib directors, guide wires, rib angle controllers, flexible support members or elongated rib steering devices **204** operable to control the angular direction of the ribs **106**; and (f) a plurality of rib connectors **18** which connect the rib steering devices **204** to the ribs **106**.

The rib driver **201** is coupled or anchored to the ribs **106**, serving as an anchoring surface **301** for the elongated ribs **106**. The drive member **202**, in one embodiment, has an outer thread or groove pattern. The rib driver **201** has an inner-threaded or inner-grooved opening configured to receive, and mate with, the threads or grooves of the drive member **202**. In one embodiment, the outer surface of the rib driver **201** has a notch, and the inner surface of the housing **103** has a longitudinal groove which mates with the notch of the rib driver **201**. The notch and groove engagement prevents the rib driver **201** from rotating as the drive member **202** rotates. As a result, the drive member **202** causes the rib driver **201** to slide up and down relative to the housing **103**.

The mount **203** is, in one embodiment, fixed within the housing **103** and acts as a support and anchoring surface for the lower ends **14** of the rib steering devices **204**. The lower ends **14** are fixedly secured to the mount **203**. The upper ends **15** of rib steering devices **204** slideably pass through openings **302** in the rib driver **201** and are attached individually to the elongated ribs **106** through flexible joints **206**. The elongated ribs **106** may comprise multiple rib sections **108** with each section coupled together such that the rib sections **108** can articulate independently of one another.

The ribs **106** and elongated rib steering devices **204** cooperate to control the opening, closing, positioning and stabilization of the canopy **107**. Depending upon the embodiment, the ribs **106** and rib steering devices **204** can be fully flexible, partially flexible, semi-rigid, partially rigid, bendable or elastic, such as in an embodiment where ribs **106** or devices **204** have a leaf spring configuration.

In one embodiment, the rib connectors **18** fixedly attach the rib steering devices **204** to the ribs **106**. In another embodiment, the rib connectors **18** slideably attach the rib steering devices **204** to the ribs **106**.

In one embodiment, the drive member **202** is located within the housing **103**. The lower end **20** of the drive member **202** is coupled or attached to a disk or pulley **22** which rotates the drive member **202** and causes the rib driver **201** to slide along the axis of the drive member **202**. As the rib driver **201** slides along the drive member **202** towards the stop member **105**, the elongated ribs **106** begin to emerge through the aperture **109** in a vertical orientation. The tension, or pulling force, from the rib steering devices **204** pulls the elongated ribs **106** downward against the inner surface of the stop member **105**. As the elongated ribs **106** emerge from the aperture **109** and approach the stop member **105**, they collectively form a cone-shaped formation having a general vertex location **24**, as illustrated in FIG. **2**.

As the elongated ribs **106** move from a closed umbrella position, where the ribs **106** are mostly or fully contained in the housing **103**, to an open umbrella position, shown in FIG. **5**, the increasing tension in the rib steering devices **204** pulls the elongated ribs **106** downward resulting in the deployment and stretching of the canopy **107**. The motion and formation of the elongated ribs **106** mimics the blossoming of a flower and allows deployment over potential obstacles, such as people's heads, without the need to move the obstacle or the umbrella assembly **10**.

In the fully deployed or open umbrella position, the rib steering devices **204** act to stabilize the canopy **107** to withstand, and counteract, an upward force of environmental elements. The stabilizing effect is due to the counteracting force of, and the tension in, the rib steering devices **204**. This force is transmitted to the respective elongated ribs **106**. In the fully deployed or open umbrella position, the elongated ribs **106** rest on the stop member **105**. This helps to stabilize the canopy **107** to withstand a downward force of environmental elements, such as the downward force of rain, wind or snow.

Referring to FIG. **5**, in one assembly not requiring pulley **22**, the sub-assembly **12** includes: (a) an actuator **26** operatively coupled to the actuator and contained within the housing **103**; (b) a rechargeable battery unit **28** mounted within the housing **103**; (c) a solar power generator or solar panels **34** mounted to the canopy **107** or exterior of the housing **103**; (d) a control switch, button or user input device **36** operable to activate the opening and closing of the umbrella assembly **10**; (e) a power cord **30** operatively coupled to the actuator **26** for plugging into an external power source **38**, such as an electrical outlet or wheelchair power supply unit; and (f) one or more circuit boards, transformers, circuitry components, electrical wires or electrical paths, such as electrical pathway **32**, which operatively couple together the actuator **26**, battery unit **28**, solar panel **34** and user input device **36**.

In one mode of operation, selectable through the input device **36**, the power cord **30** delivers A/C current to charge the battery unit **28**, and the battery unit **28** powers the operation of the actuator **26**. In another mode of operation, selectable through the input device **36**, the power cord **30**

directly powers the actuator **26**. In one embodiment, the solar panels **34** continuously converts sunlight to electrical power and charges the battery unit **28** or directly powers the actuator **26**. In one embodiment, the solar panels **34** can be integrated into, or attached to, the top surface of the canopy **107**. In one embodiment, the housing **103** holds a cord retractor configured to pull the power cord **30** into the housing **103** when the cord **30** is not in use.

The actuator **26** can include any electrical or electromechanical device operable to convert electrical energy to motion. Depending upon the embodiment, the actuator **26** can include: (a) an electrical motor with moving magnets and wound coil; (b) an electromagnet; or (c) a pump or pressure device operable to produce hydraulic fluid pressure or pneumatic pressure.

Referring still to FIG. **5**, another embodiment may include a drive belt (not shown) configured to engage the pulley **22** at one end and the drive wheel of an actuator motor (not shown) at the other end. The pulley **22** can be configured to engage the drive member **202**. The drive belt rotates the pulley **22** which, in turn, rotates the drive shaft or member **202**, which, in turn, causes the deployment or retraction of the canopy **107**. The drive member **202** rotates in one direction to open the umbrella assembly **10**, and the drive member **202** rotates in the opposite direction to close the umbrella assembly **10**. Depending upon the embodiment, the drive belt can be part of an attached structure, such as a vehicle or wheelchair which powers the movement of the drive belt.

The user input device **36**, described above, can include a switch, dial, keypad, or the like. The user input device **36** can also be a device configured to receive a wireless signal from a remote control, mobile phone, computer or tablet. The umbrella assembly **10** includes a coupler **104**, such as one of the couplers **104***a* or **104***b*, which enables the umbrella assembly **10** to be coupled to a variety of fixed or moveable structures as described above.

Referring to FIGS. **6-7**, another embodiment includes a portable holder or pack **601** that incorporates, and is configured to carry, some or all of the components of the umbrella assembly **10**. The pack **601** includes a handle or strap **40** for easy carrying or for securing it to a fixed structure or mobile structure such as the frame of a wheelchair. The pack **601** includes a top portion **42** that allows access to the contents of the pack while in the open position. The top portion may also include one or more solar panels **34** configured to charge the battery unit **44**. The interior of the pack **601** includes multiple compartments for holding the components of the assembly **10**. One compartment is configured to hold the battery unit **44**. The battery unit **44** includes a power port **46** accessible through one of the sides **41** of the pack **601** and is configured to allow the battery unit **44** to be coupled to an exterior power source for charging. The pack **601** may also be configured to have a compartment **49** for holding a power cord **48** or other power coupling device. Another compartment **37** is configured to hold a controller for the assembly **10**, such as the controller **50** illustrated in FIG. **8**. The controller allows a user to deploy and retract the canopy **107**, to tilt and position the umbrella for optimal effect all with the press of a button. The controller can be attached to the assembly **10** by a cord or may operate wirelessly or by voice or motion commands. A central compartment **39** is configured to hold the umbrella assembly **10**. The umbrella assembly **10** includes a base portion **52** which secures the assembly **10** to a surface of the pack **601** and may also contain electrical leads from the battery pack. The housing **103** is attached to the top surface of the base **52** and houses the mechanical and structural components of the assembly **10**. The housing **103** includes multiple housing sections configured to expand and contract in a telescopic manner. The housing **103** also houses a mechanism for expanding and contracting the housing sections as well as a mechanism (such as actuator **26** and drive member **202**) for deploying and retracting the canopy **107**. The pack **601** defines a hole or aperture **54** configured to allow the housing **103** to extend outside the pack **601**.

In one embodiment, the pack **601** is configured as a backpack (including, but not limited to, a hiking or school backpack or an infant carrier) with shoulder straps wearable by a user. In this embodiment, such backpack holds a relatively small-sized version of the umbrella assembly **10**. Such small or miniature umbrella assembly **10** is operable to cover the head of the user and any carried infant.

Referring to FIG. **8**, one embodiment includes a wheelchair **800** fitted with the umbrella assembly **10**. This wheelchair **800**, featuring the ease of use of the attached umbrella assembly **10**, provides users with a greater degree of protection from sun, snow, rain and other conditions that might have harmful effects on the users. In the case of quadriplegics or others with limited or insufficient upper body strength or mobility, the umbrella assembly **10** enables such users to automatically shelter themselves from those weather conditions as a healthcare benefit.

Depending upon the embodiment, the umbrella assembly **10** can be permanently integrated with or detachably coupled to the back **802** of the wheelchair **800** as illustrated in FIG. **8**. The wheelchair **800** has wheels **58**, a seat **60** with a back **62** and a bottom portion of the seat **64** which is supported by a frame **66**. The frame **66** has arms **68**, support for the back of the seat **70** that extend up to the handles **72** and are supported by a sub-frame **74**.

In the illustrated embodiment, the umbrella assembly **10** is removably attached to the wheelchair **800** as an aftermarket accessory. Specifically, the assembly **10** is attached to the sub-frame **74** through adjustable clamp couplers **104**. The assembly **10** is also electrically connected to the control pad **50** and wheelchair battery unit **76**. It will be appreciated that the user can easily deploy the umbrella assembly **10** to its extended, open position by hand operating the pad **50** while sitting in the chair. This eliminates the burden of having to standup, turn around, manipulate and hold a conventional umbrella.

The controller **50** can be connected to the umbrella opening mechanism, such as actuator **26**, by wire or wirelessly or by voice activation or motion sensor. In the illustrated embodiment, there may be controls for activating (on/off), adjusting height and adjusting tilt. An additional benefit of the manner in which the canopy operates is that deployment and retraction can occur without interfering with the wheelchair user's head or other nearby objects, such as the seat back **62** of the wheelchair **800**.

Referring to FIG. **9**, the umbrella assembly **10**, in one embodiment, exhibits a blooming formation **78** during the opening process. To achieve this blooming formation, the canopy edge **80** starts with an initial upward position **84** inside of the housing **103**. The canopy center **81** (shown in FIG. **8**) starts with an initial downward position **82** inside of the housing **103**. As the canopy center **81** slides upward through the housing **103**, the canopy edge **80** protrudes from the housing **103**, and the canopy **107** gradually forms a cone shape. The cone shape gradually expands providing the blooming formation. As illustrated, the umbrella assembly **10** can be attached to a wheelchair coupler **86** or stand **88** depending upon the embodiment.

Since the canopy edge **80** starts at the upward position **84**, the canopy **107** does not move through the occupied space **90** during its upward movement. This is an important advantage compared to conventional umbrellas, where conventional canopy centers remain at the top position, and the conventional canopy edges start at the bottom position, swing outward and interfere with people **92** and other objects **94** in the occupied space **90**.

In one embodiment, the umbrella assembly **10** includes one or more electrical sensors. The sensors are operatively coupled to the actuator **26**. Based on signals from the sensors, the actuator deactivates the actuator **26** to prevent the canopy from interfering with nearby objects, such as a tree limb, sidewalk sign, pedestrian or the user's body. The umbrella assembly **10** also includes an audio generator including an audio controller and speaker. The audio generator produces a sound, such as a high pitch, beeping sound, to alert users and others of the upcoming opening or closing of the umbrella assembly **10**.

Additional embodiments include any one of the embodiments described above, where one or more of its components, functionalities or structures is interchanged with, replaced by or augmented by one or more of the components, functionalities or structures of a different embodiment described above.

It should be understood that various changes and modifications to the embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and scope of the present disclosure and without diminishing its intended advantages. It is therefore intended that such changes and modifications be covered by the appended claims.

Although several embodiments of the disclosure have been disclosed in the foregoing specification, it is understood by those skilled in the art that many modifications and other embodiments of the disclosure will come to mind to which the disclosure pertains, having the benefit of the teaching presented in the foregoing description and associated drawings. It is thus understood that the disclosure is not limited to the specific embodiments disclosed herein above, and that many modifications and other embodiments are intended to be included within the scope of the appended claims. Moreover, although specific terms are employed herein, as well as in the claims which follow, they are used only in a generic and descriptive sense, and not for the purposes of limiting the present disclosure, nor the claims which follow.

The following is claimed:

1. An umbrella assembly comprising:

a housing extending along an axis;

a plurality of elongated ribs configured to be at least partially housed within the housing;

a canopy coupled to at least one of the elongated ribs, the canopy configured to be housed within the housing when the umbrella assembly is closed;

a position control assembly configured to be at least partially housed within the housing, the position control assembly including:

(a) at least one drive member configured to rotate to drive the elongated ribs between a plurality of positions including: (i) a first position in which at least portions of the elongated ribs are housed within the housing; and (ii) a second position in which the portions extend outside of the housing;

(b) at least one rib steering device coupled to each one of the elongated ribs, the at least one rib steering device configured to: (i) control an angle of the elongated rib relative to the axis; and (ii) stabilize the canopy to withstand an upward force of environmental elements;

(c) a drive element configured to threadably engage the at least one drive member and move along the axis as the at least one drive member rotates; and

(d) a mount configured to engage the at least one drive member and remain in a fixed position on the axis as the at least one drive member rotates; and

at least one stop member coupled to the housing, the stop member configured to: (i) support the elongated ribs when the elongated ribs are in the second position; and (ii) stabilize the canopy to withstand a downward force of environmental elements.

2. The umbrella assembly of claim **1**, wherein the elongated ribs comprise a plurality of rib sections coupled to each other by a plurality of flexible joints.

3. The umbrella assembly of claim **1**, wherein one end of each elongated rib is coupled to the drive element.

4. The umbrella assembly of claim **1**, wherein one end of each rib steering device is coupled to the mount.

5. The umbrella assembly of claim **1**, which includes an actuator configured to be operatively coupled to the drive member and a power source, the actuator being operable, when operatively coupled to the power source, to cause a change between: (a) a closed umbrella mode associated with the first position; and (b) an open umbrella mode associated with the second position.

6. The umbrella assembly of claim **5**, wherein the housing comprises a lower housing portion, and wherein at least part of the actuator is positioned within the lower housing portion.

7. An umbrella assembly comprising:

a housing extending along an axis;

a plurality of elongated ribs configured to be at least partially housed within the housing;

a canopy coupled to at least one of the elongated ribs, the canopy configured to be housed within the housing;

a position control assembly configured to be at least partially housed within the housing, the position control assembly including:

(a) at least one drive member configured to drive the elongated ribs between a plurality of positions including: (i) a first position in which at least portions of the elongated ribs are housed within the housing; and (ii) a second position in which the portions extend outside of the housing; and

(b) at least one rib steering device coupled to each one of the elongated ribs, the at least one rib steering device configured to: (i) control an angle of the elongated rib relative to the axis; and (ii) stabilize the canopy to withstand an upward force of environmental elements;

at least one stop member coupled to the housing, the stop member configured to: (i) support the elongated ribs when the elongated ribs are in the second position; and (ii) stabilize the canopy to withstand a downward force of environmental elements; and

an actuator operatively coupled to the position control assembly, the actuator being positioned within the housing and configured to be operatively coupled to an electrical power source so as to cause a change between: (a) a closed umbrella mode associated with the first position; and (b) an open umbrella mode associated with the second position.

8. The umbrella assembly of claim 7, wherein the actuator comprises an element selected from the group consisting of a motor, an electromagnet and a pump.

9. The umbrella assembly of claim 7, including:

a drive element configured to threadably engage the at least one drive member and move along the axis as the at least one drive member rotates; and

a mount configured to engage the at least one drive member and remain in a fixed position on the axis as the at one least drive member rotates.

10. The umbrella assembly of claim 9, wherein:

one end of each elongated rib is coupled to the drive element; and

one end of each rib steering device is coupled to the mount.

11. The umbrella assembly of claim 9, wherein the housing comprises a lower housing portion, and the actuator is positioned within the lower housing portion.

12. The umbrella assembly of claim 11, wherein the housing comprises a housing exterior, the umbrella assembly comprising a user input device attached to the housing exterior, the user input device being operatively coupled to the actuator.

13. The umbrella assembly of claim 12, comprising a drive element configured to rotatably engage the at least one drive member, wherein the housing comprises an elongated shape and an upper housing portion, the upper housing portion further comprising a flared shape wherein at least a portion of the at least one stop member has an arc shape, the portion configured to engage the elongated ribs when the elongated ribs are in the second positions.

14. An umbrella assembly comprising:

a housing extending along an axis;

a canopy configured to be at least partially housed within housing, the canopy including a canopy center and a canopy edge; and

at least one drive member moveably positioned within the housing, the drive member being configured to:

(a) cause the canopy center to move from an initial canopy center position within the housing to a final canopy center position located above the initial canopy center position; and

(b) cause the canopy edge to move from an initial canopy edge position within the housing to a final canopy edge position located outside of the housing, wherein the canopy edge emerges from the housing before the canopy center reaches the final canopy center position; and

an actuator operatively coupled to the at least one drive member, the actuator being at least partially positioned within the housing, the actuator being configured to:

receive an input signal; and

in response to the input signal, control a change between the initial canopy center position and the final canopy center position.

15. A wheelchair comprising the umbrella assembly of claim 14, wherein the umbrella assembly comprises at least one coupler configured to couple the housing to the wheelchair.

16. The umbrella assembly of claim 14, wherein the canopy is coupled to at least one elongated rib, and the at least one elongated rib is at least partially housed within the housing when the canopy center is in the initial canopy center position.

17. A portable holder comprising the umbrella assembly of claim 14, wherein the housing has a telescopic configuration, the portable holder comprising a handle and a panel, the portable holder defining an interior space configured to receive the housing, wherein the panel is configured to be moved to provide access to the interior space.

18. The wheelchair of claim 15, comprising a controller, the controller configured to generate the input signal.

19. The umbrella assembly of claim 14, comprising a drive element configured to rotatably engage the at least one drive member, wherein the housing comprises a lower housing portion, the actuator being positioned within the lower housing portion.

20. The umbrella assembly of claim 19, wherein the housing comprising an upper housing portion, part of the upper housing portion comprising a flared shape wherein the part is configured to support the canopy in the final canopy center position.

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